

183. (New) The fuel cell electrode of claim 178 wherein said electrocatalyst comprises a metal selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Ni, Pd, and Pt.

184. (New) The fuel cell electrode of claim 178 wherein said electrocatalyst comprises a metal selected from the group consisting of Ni, Pd, and Pt.

185. (New) The fuel cell electrode of claim 181 wherein said electrocatalyst comprises a metal selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Ni, Pd, and Pt.

186. (New) The fuel cell electrode of claim 181 wherein said electrocatalyst comprises a metal selected from the group consisting of Ni, Pd, and Pt.

187. (New) A fuel cell electrode comprising a support comprising a deposit disposed thereon, said deposit comprising a catalytically effective load of an electrocatalyst comprising at least one noble metal and comprising an electrocatalytic active area at least in part comprising rod-shaped structures of said at least one noble metal.

188. (New) The fuel cell electrode of claim 187 wherein said rod-like structures are visible at a magnification of at least about x10k.

189. (New) The fuel cell electrode of claim 187 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

190. (New) The fuel cell electrode of claim 188 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

191. (New) The fuel cell electrode of claim 187 wherein said electrocatalyst comprises platinum.

192. (New) The fuel cell electrode of claim 190 wherein said electrocatalyst comprises platinum.

193. (New) The fuel cell electrode of claim 187 wherein said electrocatalyst consists essentially of platinum.

194. (New) The fuel cell electrode of claim 190 wherein said electrocatalyst consists essentially of platinum.

195. (New) The fuel cell electrode of claim 187 wherein, at a cell potential of about 0.6 V, an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

196. (New) The fuel cell electrode of claim 190 wherein, at a cell potential of about 0.6 V, an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

197. (New) The fuel cell electrode of claim 191 wherein, at a cell potential of about 0.6 V, an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

198. (New) The fuel cell electrode of claim 192 wherein, at a cell potential of about 0.6 V, an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

199. (New) The fuel cell electrode of claim 193 wherein, at a cell potential of about 0.6 V, an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

200. (New) The fuel cell electrode of claim 194 wherein, at a cell potential of about 0.6 V, an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

201. (New) The fuel cell electrode of claim 191 wherein said load comprises less than about 0.3 mg/cm^2 of said platinum.

202. (New) The fuel cell electrode of claim 191 herein said load comprises less than about 0.2 mg/cm^2 of said platinum.

203. (New) The fuel cell electrode of claim 191 wherein said load comprises from about 0.01 to about 0.2 mg/cm^2 of said platinum.

204. (New) The fuel cell electrode of claim 191 wherein said load is about 0.01 mg/cm^2 or less of said platinum.

205. (New) The fuel cell electrode of claim 192 wherein said load comprises less than about 0.3 mg/cm^2 of said platinum.

206. (New) The fuel cell electrode of claim 192 herein said load comprises less than about 0.2 mg/cm^2 of said platinum.

207. (New) The fuel cell electrode of claim 192 wherein said load comprises from about 0.01 to about 0.2 mg/cm² of said platinum.

208. (New) The fuel cell electrode of claim 192 wherein said load is about 0.01 mg/cm² or less of said platinum.

209. (New) The fuel cell electrode of claim 197 wherein said load comprises less than about 0.3 mg/cm² of said platinum.

210. (New) The fuel cell electrode of claim 197 herein said load comprises less than about 0.2 mg/cm² of said platinum.

211. (New) The fuel cell electrode of claim 197 wherein said load comprises from about 0.01 to about 0.2 mg/cm² of said platinum.

212. (New) The fuel cell electrode of claim 197 wherein said load is about 0.01 mg/cm² or less of said platinum.

213. (New) The fuel cell electrode of claim 198 wherein said load comprises less than about 0.3 mg/cm² of said platinum.

214. (New) The fuel cell electrode of claim 198 herein said load comprises less than about 0.2 mg/cm² of said platinum.

215. (New) The fuel cell electrode of claim 198 wherein said load comprises from about 0.01 to about 0.2 mg/cm² of said platinum.

216. (New) The fuel cell electrode of claim 198 wherein said load is about 0.01 mg/cm² or less of said platinum.

217. (New) The fuel cell electrode of claim 191 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

218. (New) The fuel cell electrode of claim 195 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

219. (New) The fuel cell electrode of claim 196 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

220. (New) The fuel cell electrode of claim 197 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

221. (New) The fuel cell electrode of claim 198 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

222. (New) The fuel cell electrode of claim 199 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

223. (New) The fuel cell electrode of claim 200 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

224. (New) The fuel cell electrode of claim 187 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

225. (New) The fuel cell electrode of claim 190 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

226. (New) The fuel cell electrode of claim 197 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

227. (New) The fuel cell electrode of claim 198 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

228. (New) The fuel cell electrode of claim 225 wherein substantially all of
said surface area ionically communicates with an ionomeric membrane.

229. (New) The fuel cell electrode of claim 226 wherein substantially all of
said surface area ionically communicates with an ionomeric membrane.

230. (New) The fuel cell electrode of claim 227 wherein substantially all of
said surface area ionically communicates with an ionomeric membrane.

231. (New) A membrane electrode assembly comprising the fuel cell electrode
of claim 224.

232. (New) A membrane electrode assembly comprising the fuel cell electrode
of claim 227.

233. (New) A fuel cell electrode comprising a support comprising a deposit disposed thereon, said deposit comprising a catalytically effective load of an electrocatalyst comprising platinum and comprising an electrocatalytic active area at least in part comprising rod-shaped structures of said electrocatalyst, wherein at a cell potential of about 0.6 V, an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

234. (New) The fuel cell electrode of claim 233 wherein said rod-like structures are visible at a magnification of at least about x10k.

235. (New) The fuel cell electrode of claim 233 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

236. (New) The fuel cell electrode of claim 234 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

237. (New) The fuel cell electrode of claim 233 wherein said support is a carbon catalyst support.

238. (New) The fuel cell electrode of claim 236 wherein said support is a carbon catalyst support.

239. (New) The fuel cell electrode of claim 233 wherein said load comprises less than about 0.3 mg/cm^2 of said platinum.

240. (New) The fuel cell electrode of claim 233 herein said load comprises less than about 0.2 mg/cm^2 of said platinum.

241. (New) The fuel cell electrode of claim 233 wherein said load comprises from about 0.01 to about 0.2 mg/cm^2 of said platinum.

242. (New) The fuel cell electrode of claim 233 wherein said load is about 0.01 mg/cm^2 or less of said platinum.

243. (New) The fuel cell electrode of claim 237 wherein said load comprises less than about 0.3 mg/cm^2 of said platinum.

244. (New) The fuel cell electrode of claim 237 herein said load comprises less than about 0.2 mg/cm^2 of said platinum.

245. (New) The fuel cell electrode of claim 237 wherein said load comprises from about 0.01 to about 0.2 mg/cm² of said platinum.

246. (New) The fuel cell electrode of claim 237 wherein said load is about 0.01 mg/cm² or less of said platinum.

247. (New) The fuel cell electrode of claim 238 wherein said load comprises less than about 0.3 mg/cm² of said platinum.

248. (New) The fuel cell electrode of claim 238 herein said load comprises less than about 0.2 mg/cm² of said platinum.

249. (New) The fuel cell electrode of claim 238 wherein said load comprises from about 0.01 to about 0.2 mg/cm² of said platinum.

250. (New) The fuel cell electrode of claim 238 wherein said load is about 0.01 mg/cm² or less of said platinum.

251. (New) The fuel cell electrode of claim 233 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

252. (New) The fuel cell electrode of claim 237 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

253. (New) The fuel cell electrode of claim 238 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

254. (New) The fuel cell electrode of claim 244 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

255. (New) The fuel cell electrode of claim 248 wherein said support has a surface area, and said deposit covers about 300 cm² or more of said surface area.

256. (New) The fuel cell electrode of claim 237 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

257. (New) The fuel cell electrode of claim 238 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

258. (New) The fuel cell electrode of claim 248

said support has a surface area; and,
 substantially all of said surface area ionically communicates with an ionomeric
 membrane.

259. (New) The fuel cell electrode of claim 255 wherein
 said support has a surface area; and,
 substantially all of said surface area ionically communicates with an ionomeric
 membrane.

260. (New) The fuel cell electrode of claim 256 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

261. (New) The fuel cell electrode of claim 260 wherein said composite
comprises a thickness of about 1 μm .

262. (New) The fuel cell electrode of claim 257 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

263. (New) The fuel cell electrode of claim 262 wherein said composite
comprises a thickness of about 1 μm .

264. (New) The fuel cell electrode of claim 258 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

265. (New) The fuel cell electrode of claim 264 wherein said composite
comprises a thickness of about 1 μm .

266. (New) The fuel cell electrode of claim 259 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

267. (New) The fuel cell electrode of claim 266 wherein said composite
comprises a thickness of about 1 μm .

268. (New) The fuel cell electrode of claim 260 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

269. (New) The fuel cell electrode of claim 268 wherein said composite comprises a thickness of about $1 \mu\text{m}$.

270. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 232.

271. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 268.

272. (New) A fuel cell electrode comprising a support comprising a deposit disposed thereon, said deposit comprising a catalytically effective load of an electrocatalyst comprising less than about 0.2 mg/cm^2 platinum, and comprising an electrocatalytic active area at least in part comprising rod-shaped structures of said electrocatalyst, wherein said support has a surface area, and said deposit covers about 300 cm^2 or more of said surface area, wherein, at a cell potential of about 0.6 V , an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

273. (New) The fuel cell electrode of claim 272 wherein said rod-like structures are visible at a magnification of at least about $\times 10\text{k}$.

274. (New) The fuel cell electrode of claim 272 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

275. (New) The fuel cell electrode of claim 273 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

276. (New) The fuel cell electrode of claim 272 wherein said support is a carbon catalyst support.

277. (New) The fuel cell electrode of claim 275 wherein said support is a carbon catalyst support.

278. (New) The fuel cell electrode of claim 272 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

279. (New) The fuel cell electrode of claim 275 wherein

said support has a surface area; and,
 substantially all of said surface area ionically communicates with an ionomeric
 membrane.

280. (New) The fuel cell electrode of claim 276 wherein
 said support has a surface area; and,
 substantially all of said surface area ionically communicates with an ionomeric
 membrane.

281. (New) The fuel cell electrode of claim 277 wherein said carbon catalyst
support comprises a material selected from the group consisting of a carbon filament
bundle, reticulated carbon, carbon cloth, and carbon mesh.

282. (New) The fuel cell electrode of claim 277 wherein said carbon catalyst
support comprises a material selected from the group consisting of a carbon cloth and a
coating on a carbon cloth selected from the group consisting of carbon, a wet proofing
material, and a combination thereof.

283. (New) The fuel cell electrode of claim 278 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

284. (New) The fuel cell electrode of claim 283 wherein said composite
comprises a thickness of about 1 μm .

285. (New) The fuel cell electrode of claim 279 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

286. (New) The fuel cell electrode of claim 285 wherein said composite
comprises a thickness of about 1 μm .

287. (New) The fuel cell electrode of claim 280 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

288. (New) The fuel cell electrode of claim 287 wherein said composite
comprises a thickness of about 1 μm .

289. (New) A membrane electrode assembly comprising the fuel cell electrode
of claim 272.

290. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 288.

291. (New) A fuel cell electrode comprising a support comprising a deposit disposed thereon, said deposit comprising a catalytically effective load of platinum, and comprising an electrocatalytic active area at least in part comprising rod-shaped structures of said platinum.

292. (New) The fuel cell electrode of claim 291 wherein said rod-like structures are visible at a magnification of at least about x10k.

293. (New) The fuel cell electrode of claim 291 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

294. (New) The fuel cell electrode of claim 292 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

295. (New) The fuel cell electrode of claim 291 wherein said support is a carbon catalyst support.

296. (New) The fuel cell electrode of claim 294 wherein said support is a carbon catalyst support.

297. (New) The fuel cell electrode of claim 291 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

298. (New) The fuel cell electrode of claim 295 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

299. (New) The fuel cell electrode of claim 296 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

300. (New) The fuel cell electrode of claim 296 wherein said carbon catalyst support comprises a material selected from the group consisting of a carbon filament bundle, reticulated carbon, carbon cloth, and carbon mesh.

301. (New) The fuel cell electrode of claim 296 wherein said carbon catalyst support comprises a material selected from the group consisting of a carbon cloth and a coating on a carbon cloth selected from the group consisting of carbon, a wet proofing material, and a combination thereof.

302. (New) The fuel cell electrode of claim 297 wherein said ionomeric membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion exchange media.

303. (New) The fuel cell electrode of claim 302 wherein said composite comprises a thickness of about 1 μm .

304. (New) The fuel cell electrode of claim 298 wherein said ionomeric membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion exchange media.

305. (New) The fuel cell electrode of claim 304 wherein said composite comprises a thickness of about 1 μm .

306. (New) The fuel cell electrode of claim 299 wherein said ionomeric membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion exchange media.

307. (New) The fuel cell electrode of claim 306 wherein said composite comprises a thickness of about 1 μm .

308. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 291.

309. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 307.

310. (New) A fuel cell electrode comprising a support comprising a deposit disposed thereon, said deposit comprising a catalytically effective load of platinum, and comprising an electrocatalytic active area at least in part comprising rod-shaped structures of said platinum. wherein said support has a surface area, and said deposit covers about 300 cm^2 or more of said surface area, wherein, at a cell potential of about

0.6 V, an MEA containing said fuel cell electrode as a half cell operating as a cathode yields a power output of about 800 mA cm^{-2} or greater.

311. (New) The fuel cell electrode of claim 310 wherein said rod-like structures are visible at a magnification of at least about x10k.

312. (New) The fuel cell electrode of claim 310 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

313. (New) The fuel cell electrode of claim 311 wherein said deposit further comprises particles of said electrocatalyst comprising an outer surface, wherein said electrocatalytic active area comprises a majority of said outer surface of said particles.

314. (New) The fuel cell electrode of claim 310 wherein said electrocatalyst consists essentially of platinum.

315. (New) The fuel cell electrode of claim 313 wherein said electrocatalyst consists essentially of platinum.

316. (New) The fuel cell electrode of claim 310 wherein said support is a carbon catalyst support.

317. (New) The fuel cell electrode of claim 313 wherein said support is a carbon catalyst support.

318. (New) The fuel cell electrode of claim 314 wherein said support is a carbon catalyst support.

319. (New) The fuel cell electrode of claim 315 wherein said support is a carbon catalyst support.

320. (New) The fuel cell electrode of claim 310 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

321. (New) The fuel cell electrode of claim 316 wherein
said support has a surface area; and,
substantially all of said surface area ionically communicates with an ionomeric
membrane.

322. (New) The fuel cell electrode of claim 317 wherein

said support has a surface area; and,
 substantially all of said surface area ionically communicates with an ionomeric
 membrane.

323. (New) The fuel cell electrode of claim 318 wherein
 said support has a surface area; and,
 substantially all of said surface area ionically communicates with an ionomeric
 membrane.

324. (New) The fuel cell electrode of claim 319 wherein
 said support has a surface area; and,
 substantially all of said surface area ionically communicates with an ionomeric
 membrane.

325. (New) The fuel cell electrode of claim 317 wherein said carbon catalyst
support comprises a material selected from the group consisting of a carbon filament
bundle, reticulated carbon, carbon cloth, and carbon mesh.

326. (New) The fuel cell electrode of claim 319 wherein said carbon catalyst
support comprises a material selected from the group consisting of a carbon filament
bundle, reticulated carbon, carbon cloth, and carbon mesh.

327. (New) The fuel cell electrode of claim 317 wherein said carbon catalyst
support comprises a material selected from the group consisting of a carbon cloth and a
coating on a carbon cloth selected from the group consisting of carbon, a wet proofing
material, and a combination thereof.

328. (New) The fuel cell electrode of claim 319 wherein said carbon catalyst
support comprises a material selected from the group consisting of a carbon cloth and a
coating on a carbon cloth selected from the group consisting of carbon, a wet proofing
material, and a combination thereof.

329. (New) The fuel cell electrode of claim 320 wherein said ionomeric
membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion
exchange media.

330. (New) The fuel cell electrode of claim 329 wherein said composite
comprises a thickness of about 1 μm .

331. (New) The fuel cell electrode of claim 321 wherein said ionomeric membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion exchange media.

332. (New) The fuel cell electrode of claim 331 wherein said composite comprises a thickness of about 1 μm .

333. (New) The fuel cell electrode of claim 322 wherein said ionomeric membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion exchange media.

334. (New) The fuel cell electrode of claim 333 wherein said composite comprises a thickness of about 1 μm .

335. (New) The fuel cell electrode of claim 323 wherein said ionomeric membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion exchange media.

336. (New) The fuel cell electrode of claim 335 wherein said composite comprises a thickness of about 1 μm .

337. (New) The fuel cell electrode of claim 324 wherein said ionomeric membrane comprises a composite of polytetrafluoroethylene comprising impregnated ion exchange media.

338. (New) The fuel cell electrode of claim 337 wherein said composite comprises a thickness of about 1 μm .

339. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 363.

340. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 310.

341. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 329.

342. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 330.

343. (New) A membrane electrode assembly comprising the fuel cell electrode of claim 332.